

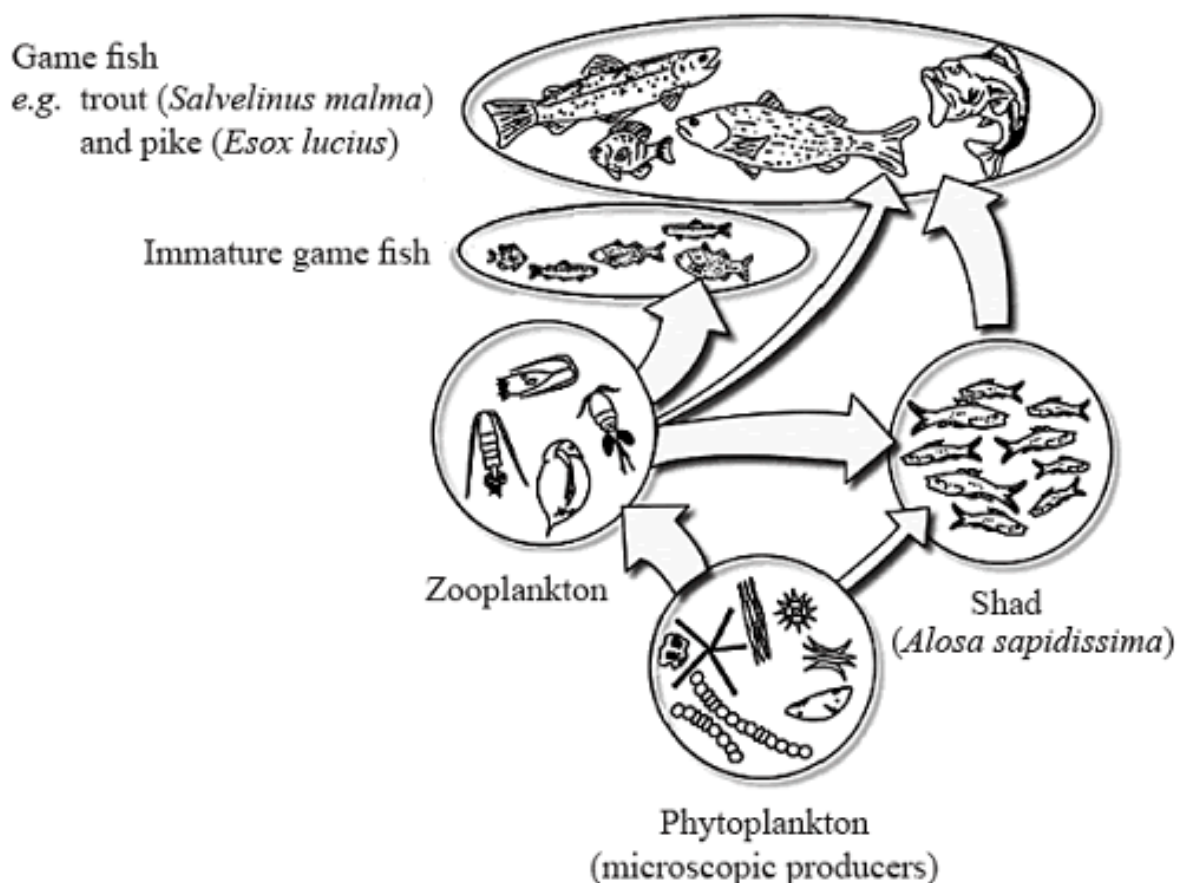
Annotation of a Food Web to show Energy Flow

Teacher Directions

This activity is designed to help students practice the skill of reading and interpreting diagrams and annotating a diagram. It is suitable for use as an assignment, class activity, group work or a test question. Students can indicate the divisions into levels by a variety of means: colour groupings, circling like groups, dividing by lines, etc. Shad will be included in 2 levels as it functions as both a primary and secondary consumer.

Student directions

Annotate the food web below to show the energy flow through the ecosystem. Start the producer level with 100,000 KJ of energy and annotate the diagram to show the efficiency of energy transfer through this system.



[Source: Water on the Web (2004), *Monitoring Minnesota Lakes on the Internet and Training Water Science Technicians for the Future – A National On-line Curriculum using Advanced Technologies and Real-Time Data*, www.waterontheweb.org/under/lakeecology/11_foodweb.html, reprinted with the permission of Water on the Web project, University of Minnesota, Duluth, MN 55812]

Support material

Markschemes/markings notes:

Student must have

- Divided the food chain into levels (Level I phytoplankton, level II shad and zooplankton, Level III Immature game fish and game fish and shad)
- Assigned Level I the energy value of 100,000 KJ
- Transferred 5-20% up each level e.g. 10% transfer would have Level II at 10,000 KJ and Level III at 1,000 KJ
- Indicated the level of energy transfer in words, e.g in the sample above they would state in words somewhere that energy transfer is less than 100% efficient (may give range)

Examiner notes:

Command Terms Guidesheet

Objective 1

Define - Give the precise meaning of a word, phrase or physical quantity.

Draw - Represent by means of pencil lines.

Label - Add labels to a diagram.

List - Give a sequence of names or other brief answers with no explanation.

Measure - Find a value for a quantity.

State - Give a specific name, value or other brief answer without explanation or calculation.

Objective 2

Annotate - Add brief notes to a diagram or graph.

Apply - Use an idea, equation, principle, theory or law in a new situation.

Calculate - Find a numerical answer showing the relevant stages in the working (unless instructed not to do so).

Describe - Give a detailed account.

Distinguish - Give the differences between two or more different items.

Estimate - Find an approximate value for an unknown quantity.

Identify - Find an answer from a given number of possibilities.

Outline - Give a brief account or summary.

Objective 3

Analyse - Interpret data to reach conclusions.

Comment - Give a judgment based on a given statement or result of a calculation.

Compare - Give an account of similarities and differences between two (or more) items, referring to both (all) of them throughout.

Construct - Represent or develop in graphical form.

Deduce - Reach a conclusion from the information given.

Derive - Manipulate a mathematical relationship(s) to give a new equation or relationship.

Design - Produce a plan, simulation or model.

Determine - Find the only possible answer.

Discuss - Give an account including, where possible, a range of arguments for and against the relative importance of various factors, or comparisons of alternative hypotheses.

Evaluate - Assess the implications and limitations.

Explain - Give a detailed account of causes, reasons or mechanisms.

Predict - Give an expected result.

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Show - Give the steps in a calculation or derivation.

Sketch - Represent by means of a graph showing a line and labelled but unscaled axes but with important features (for example, intercept) clearly indicated.

Solve - Obtain an answer using algebraic and/or numerical methods.

Suggest - Propose a hypothesis or other possible answer.

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Subject:

Biology

DP Component & Criteria:

Short-answer Questions/Paper 2 and 3

Component type:

Internal

MYP Criteria:

Group 4 / Sciences